

CLAIMS

What is claimed is:

1. A rack system for carrying cargo items on a vehicle having a substantially vertical surface, a bumper, and a hitch receiver, the rack system comprising:
 2. bumper connectors for coupling to the bumper;
 3. vertical rails;
 4. horizontal rails connected to the vertical rails;
 5. at least one of the vertical rails and the horizontal rails coupled to the bumper connectors;
 6. and
 7. support bars extending substantially longitudinally and coupled to at least one of the vertical and horizontal rails, for supporting the cargo items.
1. 2. The rack system of claim 1 wherein the substantially vertical surface comprises a back end of the vehicle, and the bumper comprises a rear bumper at the back end.
3. 3. The rack system of claim 1 further comprising:
 4. a tray for supporting weight of the cargo items.
1. 4. The rack system of claim 3 wherein:
 2. the tray is adapted for coupling to the hitch receiver.
1. 5. The rack system of claim 3 further comprising:
 2. at least one stabilizer bar coupled to the tray and to a bumper connector.
1. 6. The rack system of claim 3 further comprising:
 2. a combination lockbox securely coupled to the tray.
1. 7. The rack system of claim 1 further comprising:
 2. rail connectors coupling the horizontal rails to the vertical rails.

1 8. The rack system of claim 7 wherein:

2 at least some of the rail connectors are movable to enable repositioning of at least one of
3 the rails.

1 9. The rack system of claim 1 wherein:

2 the at least one of the vertical rails and the horizontal rails is pivotably coupled to the
3 bumper connectors.

1 10. The rack system of claim 9 further comprising:

2 a spring coupled to at least one of the bumper connectors to maintain an upper portion of
3 the rack system against the vehicle under pressure.

1 11. The rack system of claim 1 further comprising:

2 at least one pad coupled to the rails to protect the vehicle from damage by the rack
3 system.

1 12. The rack system of claim 1 further comprising:

2 bar connectors coupling the support bars to the rails.

1 13. The rack system of claim 12 wherein:

2 at least one of the bar connectors is movable to enable repositioning of its support bar to
3 adapt the rack system for carrying different cargo items.

1 **14.** A cargo rack for carrying elongated cargo such as surfboards on a substantially vertical
2 surface of a vehicle such as an RV, the cargo rack comprising:

3 bumper connectors for coupling to a bumper of the vehicle;

4 vertical rails coupled to the bumper connectors;

5 horizontal rails coupled to the vertical rails;

6 support bars coupled to the horizontal rails and extending backward for holding the
7 elongated cargo in position; and

8 a tray for coupling to a hitch receiver of the vehicle, for bearing the weight of the
9 elongated cargo.

1 15. The cargo rack of claim 14 wherein the substantially vertical surface comprises a back
2 end of the vehicle, and the bumper comprises a rear bumper of the vehicle.

3 16. The cargo rack of claim 14 wherein:
4 at least one of the horizontal rails is slidably coupled to the vertical rails.

1 17. The cargo rack of claim 16 wherein:
2 at least one of the support bars is slidably coupled to the horizontal rails.

1 18. The cargo rack of claim 14 further comprising:
2 at least one stabilizer coupled to the tray and to one of a bumper connector and a vertical
3 rail.

1 19. The cargo rack of claim 14 further comprising:
2 springs coupled to the vertical rails and to the bumper connectors for pressing the cargo
3 rack against the back of the vehicle.

1 20. The cargo rack of claim 14 wherein:
2 the cargo rack is adapted for being mounted to the vehicle without any modifications of
3 the vehicle, with the cargo rack being connected to the vehicle only at the bumper and the
4 receiver hitch.

1 21. The cargo rack of claim 14 wherein:
2 the cargo rack is adapted for carrying at least one surfboard.

1 22. The cargo rack of claim 14 wherein:
2 the cargo rack is adapted for carrying at least one of a canoe and a kayak.

1 23. The cargo rack of claim 14 wherein:
2 the cargo rack is adapted for carrying a ladder.

24. The cargo rack of claim 14 wherein:

the support bars can be repositioned to adapt the cargo rack for carrying a variety of cargo items.

25. A vehicle comprising:

a frame;

a body coupled to the frame;

a bumper coupled to the frame at a rear of the body;

a hitch receiver coupled to the frame at the rear of the body;

a cargo rack coupled only to the bumper and including,

vertical rails,

horizontal rails coupled to the vertical rails, and

support bars coupled to the horizontal rails for holding cargo items in position;

and

a tray coupled to the hitch receiver for bearing the weight of the cargo items.

26. The vehicle of claim 25 wherein the vehicle comprises:

one of an RV, a trailer, a truck, a camper, an SUV, and a passenger car.

27. The vehicle of claim 25 wherein:

the support bars are movably coupled to the horizontal rails, whereby they may be positioned to adapt the cargo rack for use with a variety of cargo items.

28. An apparatus for use with a motor vehicle and a trailer, the apparatus comprising:

first means for carrying cargo items;

second means, coupled to the first means, for coupling to a hitch receiver of the motor vehicle;

third means, coupled to one of the first means and the second means, for coupling to a hitch of the trailer;

whereby the motor vehicle is enabled to simultaneously carry the cargo items and tow the trailer.

- 1 29. The apparatus of claim 28 wherein:
 - 2 the first means comprises a tray.
- 1 30. The apparatus of claim 28 wherein:
 - 2 the first means comprises a rack.
- 1 31. The apparatus of claim 28 wherein:
 - 2 the third means comprises a hitch receiver for coupling to a removable hitch module.
- 1 32. The apparatus of claim 31 further comprising:
 - 2 the hitch module.
- 1 33. The apparatus of claim 28 wherein:
 - 2 the third means comprises an integral hitch to which a ball may be coupled for towing the
 - 3 trailer.